

Stanley Access Technologies
Quick-Reference Guide



**Magic-Swing™ and Magic-Force™ HDLE/FE
Microprocessor Control Box
Quick-Reference Guide**

203959

Rev. F, 10/2/02

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Quick-Reference Guide

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1. PURPOSE

1.1 **Discussion**

This manual provides abbreviated descriptive information, wiring instructions, and tune-in instructions for the microprocessor control box used with Magic-Swing™ and Magic-Force™ operators. The manual is intended as a quick-reference guide.

1.2 **Applicability**

Two configurations of the microprocessor control box are currently in use, each with a distinct decal on the control box cover. The newer (HDLE/FE) configuration is identified by a decal with yellow text on a black background. The common name for this configuration is the black-label box. The early model configuration is identified by a decal with black text on a yellow background. The common name for this configuration is the yellow-label box. Black-label control boxes can replace yellow-label boxes, but yellow-label boxes *cannot* replace black-label boxes. *This manual covers operation of HDLE/FE (black-label) control boxes only.* For yellow-label control box operating instructions, refer to Stanley Access Technologies document No. 203821, "Magic-Swing™ Microprocessor Control Box."

Attachment 9 provides an overview of the HDLE/FE control box. Additional differences between the yellow-label and black-label boxes include the following:

- The power switch has been deleted.
- A torque potentiometer has been added to accommodate adjusting from low to full energy.
- A separate Magic-Touch™ time delay rotary switch has been added. The time delay settings are 2 to 20 seconds or 5 to 20 seconds, depending on the version of the microprocessor installed.
- A Magic-Touch sensitivity adjustment has been added.
- Control box dual in-line package (DIP) switch configurations have changed. On yellow-label control boxes, DIP switch S2 is a four-bank switch and DIP switch S3 is a two-bank switch. On black-label control boxes, DIP switch S3 has been eliminated and DIP switch S2 has been replaced with a larger seven-bank switch. DIP switch S2 now also controls the features previously controlled by S3. On black-label control boxes, rotary switch S4 has been added to control the Magic-Touch time delay.
- A counter activation signal has been provided.

1.3 **Features and Functions**

- 1.3.1 Magic-Touch™: A feature that allows the door to be actuated by a slight manual movement of the door--without the need for an approach sensor. The microprocessor control box provides a rotary switch that controls the Magic-Touch hold-open time delay. The switch settings vary according to the version of microprocessor installed. (The version is printed on the microprocessor.) Attachment 9 describes the hold-open time delays for the two microprocessor versions. Magic-Touch can be used with press

plates or a radio control system, providing the system with two separate time delays. Magic-Touch is not recommended for use with a dual door system using Sentrex™.

- 1.3.2 Learn Speed: When power is first turned on and an "open" signal is applied, the control box opens the door in "learn speed," a slightly faster speed than open check. The controller counts encoder pulses, learning the operator rotation from closed to open. The calculated learn value is lost whenever power is lost.
- 1.3.3 Reverse On Obstruction: A one-second reverse-on-obstruction feature causes the door to reverse motion if an obstruction is met during door opening or closing.
- 1.3.4 Safety Check: This feature monitors the safety signal activation on every open cycle. If a safety carpet or overhead safety sensor fails "open" and can no longer detect a pedestrian, the door stays open for 12 seconds to indicate that there is a problem.
- 1.3.5 Emergency Breakout: Disconnects power to the motor when the door is manually pushed in the emergency-out direction. The operator then automatically resets and power is resumed.
- 1.3.6 2S Logic: Used in trained-traffic applications and is not compatible with sensors. Allows door to open when switch is pushed and door to close when next sequential switch is pushed.
- 1.3.7 Automatic Open Check Calculation: Open check position—the area where the door slows down before fully open—is calculated for approximately 80° in the opening direction during "learn cycle."
- 1.3.8 Low- and High-Energy Operation: Allows selection of low-speed range (low-energy applications) or high-speed range (full-energy and all dual-operator applications).
- 1.3.9 Bifold Safety Sensor Logic: Allows manual selection of bifold logic versus carpet or timer logic via DIP switch. Used in bifold door systems, it eliminates the need for a lockout relay for the overhead safety sensor.
- 1.3.10 Single- or Dual-Door Selection: Allows manual selection of single- or dual-door operation via DIP switch.
- 1.3.11 Opening Speed Adjustment: Opening speed potentiometer permits adjustment of door opening speed.
- 1.3.12 Closing Speed Adjustment: On Magic-Force operators, a dual-adjustment closing speed control with two rheostats permits independent adjustment of door closing speed and closing check speed. On Magic-Swing operators, provisions are provided for the installation of an optional single-adjustment closing speed control.
- 1.3.13 Open Check Speed Adjustment: Open check speed potentiometer permits adjustment of door open check speed.
- 1.3.14 Torque Adjustment: Allows adjustment of the door opening force.
- 1.3.15 Stall Logic: Used with a door-mounted sensor system to stop door motion when a pedestrian or object is present.
- 1.3.16 One-Piece Switch Module: On Magic-Force operators, the individual breakout, breakout status, close check, and auxiliary switches have been replaced with a single one-piece switch module.

2. PRECAUTIONS

- 2.1 If the Magic-Touch time delay is set to 2 seconds, a safety sensor *must* be installed to ensure compliance with ANSI A156.19, “American National Standard for Power Assist and Low Energy Power Operated Doors,” specifications.

3. WIRING INSTRUCTIONS

3.1 **Evaluating Power Requirements**

3.1.1 EVALUATE door system power requirements as follows:

- ENSURE power source is a dedicated 117 VAC, 50/60 Hz source with 20A circuit rating per two-door system.
- ENSURE power source is not shared with other equipment, i.e., cash registers, EAS systems, or other electromagnetic interference generators.

3.2 **Connecting Main Power Wiring**

WARNING

To prevent injury to personnel, incoming electrical power to header must be deenergized before connecting control box electrical harness to electrical service.

- 3.2.1 DEENERGIZE incoming electrical power to header.
- 3.2.2 Refer to Attachment 4, and, using the wire nut provided, CONNECT ground wire assembly (P/N 711527) to electrical service ground wire.
- 3.2.3 In a concealed location inside the header (not visible from the exterior of the header), DRILL a hole for a No. 8 screw.
- 3.2.4 INSTALL ground wire ring terminal and star washer onto the No. 8 screw provided, and FASTEN screw, star washer, and ground wire to header.
- 3.2.5 In a concealed location inside the header, DRILL a second hole for a No. 8 screw.
- 3.2.6 INSTALL main harness (J1) ring terminal and star washer onto the No. 8 screw provided, and FASTEN screw, star washer, and ground wire to header.
- 3.2.7 Using the wire nuts provided, CONNECT power pigtail assembly (712846) to electrical service as follows:
- CONNECT power pigtail assembly black wire to black (line) service wire.
 - CONNECT power pigtail assembly white wire to white (neutral) service wire.
- 3.2.8 ENSURE power pigtail assembly is *not* connected to main harness connector J1.

3.3 Connecting Breakout Status Signal Wiring (Magic-Swing Operators)

WARNING

To prevent injury to personnel and damage to equipment, control box power must be deenergized before connecting breakout status signal wiring.

CAUTION

If the motor is running and the breakout status switch is *not* connected, arcing across the breakout switch contacts can occur. This will result in damage to the breakout switch. To prevent damage from switch contact arcing, the breakout status switch must *always* be connected.

3.3.1 DISCONNECT power pigtail assembly.

NOTE

1. The breakout status switch should be used in *all* applications where there is no positive door stop in the breakout direction.
2. The auxiliary switch is the breakout status signal switch. The auxiliary switch was formerly the open check switch on the operator switch plate (top cam).

3.3.2 Refer to Attachment 1, and CONNECT breakout status wiring.

3.3.3 REMOVE quick-connect terminal (brown wire) from the normally open terminal of the auxiliary switch (formerly open check switch), and INSTALL onto normally closed terminal.

3.3.4 CONNECT yellow jumper wires installed on the single/dual motor harness as follows:

- a. REMOVE control box jumper wire from terminals 6 and 8.
- b. INSTALL stripped end of first jumper wire (from position 3 of the 8-pin connector on operator harness) into terminal 6 of control box connector TB1.
- c. INSTALL stripped end of second jumper wire (from position 5 of the 8-pin connector on operator harness) into terminal 8 of control box connector TB1.

3.3.5 SET the auxiliary cam for approximately 3° activation (toward breakout direction), and ADJUST cam as necessary to trip the corresponding microswitch prior to activation of the breakout switch.

NOTE

In a dual-door application, the breakout switches of each operator need to be wired in series to ensure that the control box will not open the doors if either breakout status switch is activated.

3.3.6 IF application is a pair of doors, PERFORM the following:

- a. REPEAT steps 3.3.4 and 3.3.5 for the second door operator.
- b. CONNECT stripped end of one yellow jumper wire from each operator across terminals 6 and 8 of control box connector TB1.

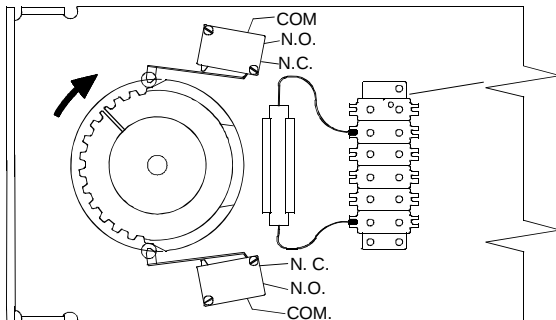
3.3.7 Using a wire nut, CONNECT remaining wire from first operator to remaining wire on second operator.

3.3.8 VERIFY breakout status/breakout cam is properly set as follows:

- a. Refer to Figure 1, and visually INSPECT cams for proper setting.

Figure 1. Breakout Status/Breakout Cam Settings (Magic-Swing Operators)

TOP CAM = AUX SWITCH
CENTER CAM = EMERGENCY BREAKOUT SWITCH
BOTTOM CAM = CLOSE CHECK SWITCH



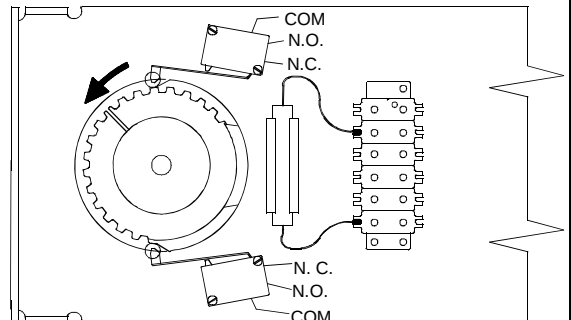
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EMERGENCY SWITCH
N.C.: RED
N.O.: YELLOW
COM.: BLACK

OPEN CHECK SWITCH
N.O.: BROWN
COM.: ORANGE

CLOSE CHECK SWITCH
N.C.: WHITE
COM.: BLUE

TOP CAM = AUX SWITCH
CENTER CAM = EMERGENCY BREAKOUT SWITCH
BOTTOM CAM = CLOSE CHECK SWITCH



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mcb002

- b. UNPLUG TB1 from control box circuit board.

NOTE

When checking breakout status switch continuity, the switch is first checked with the door closed, then again with the door in the breakout (negative 3°) position. In a dual-door application, both doors can be tested at the same time in the closed position. However, the doors must be tested *individually* when checking switch continuity with the doors in the breakout (negative 3°) position.

- c. ENSURE door is in the closed position.
- d. Using a multimeter, CHECK continuity between TB1 terminals 6 and 8, and ENSURE there is continuity.
- e. PUSH door in the breakout direction, and HOLD door at approximately the negative 3° position.
- f. Using a multimeter, CHECK continuity between TB1 terminals 6 and 8, and ENSURE there is an open circuit.
- g. RELEASE door.
- h. PLUG TB1 into control box circuit board.

3.4 Connecting Breakout Status Signal Wiring (Magic-Force Operators)

WARNING

To prevent injury to personnel and damage to equipment, control box power must be deenergized before connecting breakout status signal wiring.

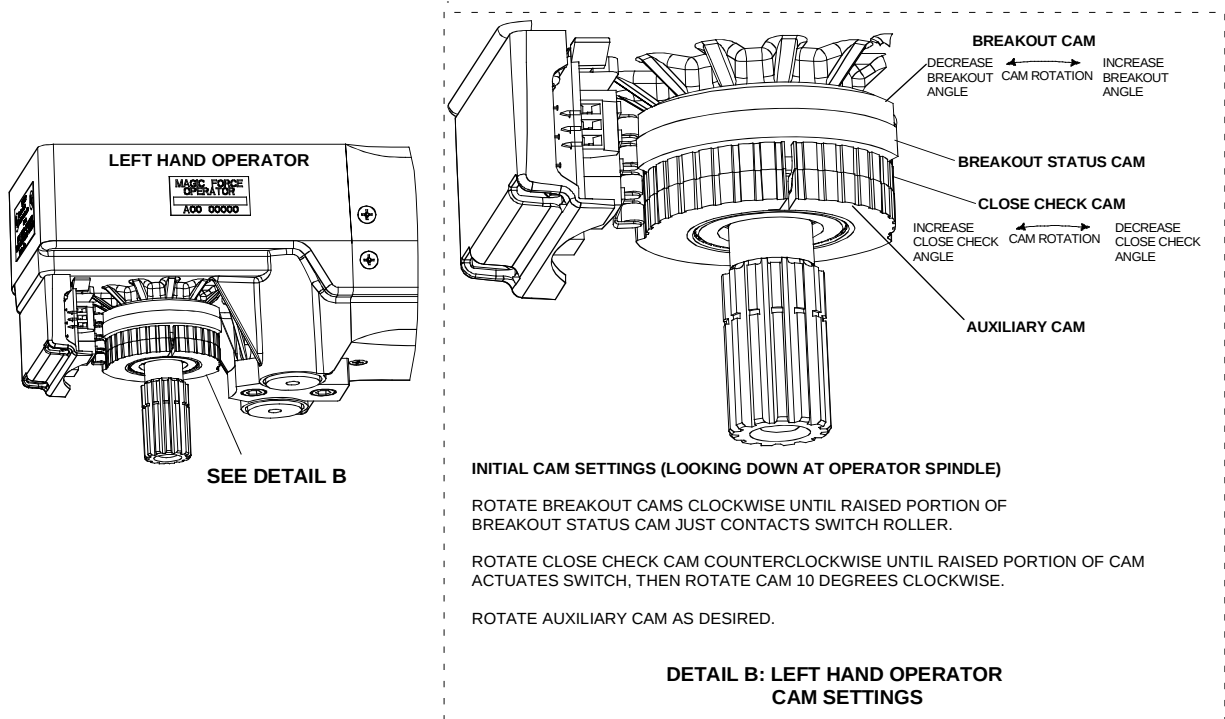
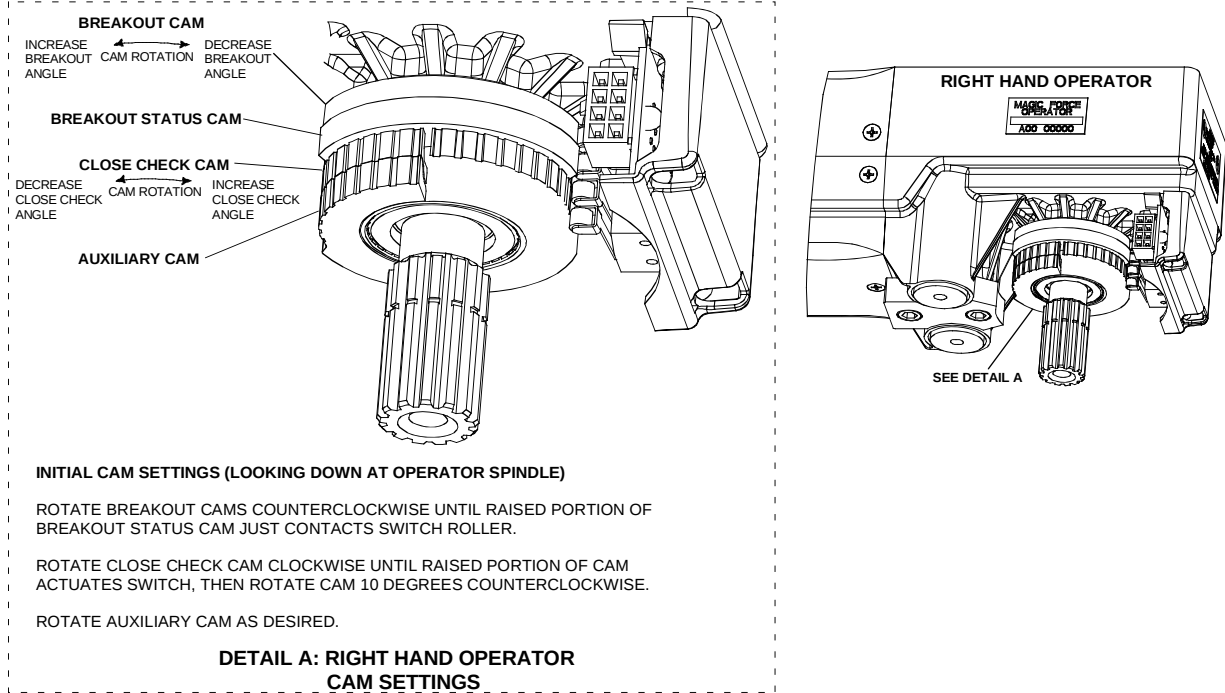
CAUTION

If the motor is running and the breakout status switch is *not* connected, arcing across the breakout switch contacts can occur. This will result in damage to the breakout switch. To prevent damage from switch contact arcing, the breakout status switch must *always* be connected.

- 3.4.1 DISCONNECT power pigtail assembly.
- 3.4.2 IF single-operator application, PERFORM the following:
 - INSTALL one breakout status switch wire (yellow) to terminal 6 of control box connector TB1.
 - INSTALL second breakout status switch wire (yellow) to terminal 8 of control box connector TB1.
- 3.4.3 IF dual-operator application, PERFORM the following:
 - INSTALL one breakout status switch wire (yellow) from one operator to terminal 6 of control box connector TB1.
 - INSTALL one breakout status switch wire (yellow) from second operator to terminal 8 of control box connector TB1.
 - CONNECT remaining two yellow breakout status switch wires together with a wire nut.
- 3.4.4 VERIFY breakout status/breakout cams are properly set as follows:

a. Refer to Figure 2, and visually INSPECT cams for proper setting.

Figure 2. Breakout Status/Breakout Cam Settings (Magic-Force Operators)



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- b. UNPLUG TB1 from control box circuit board.

NOTE

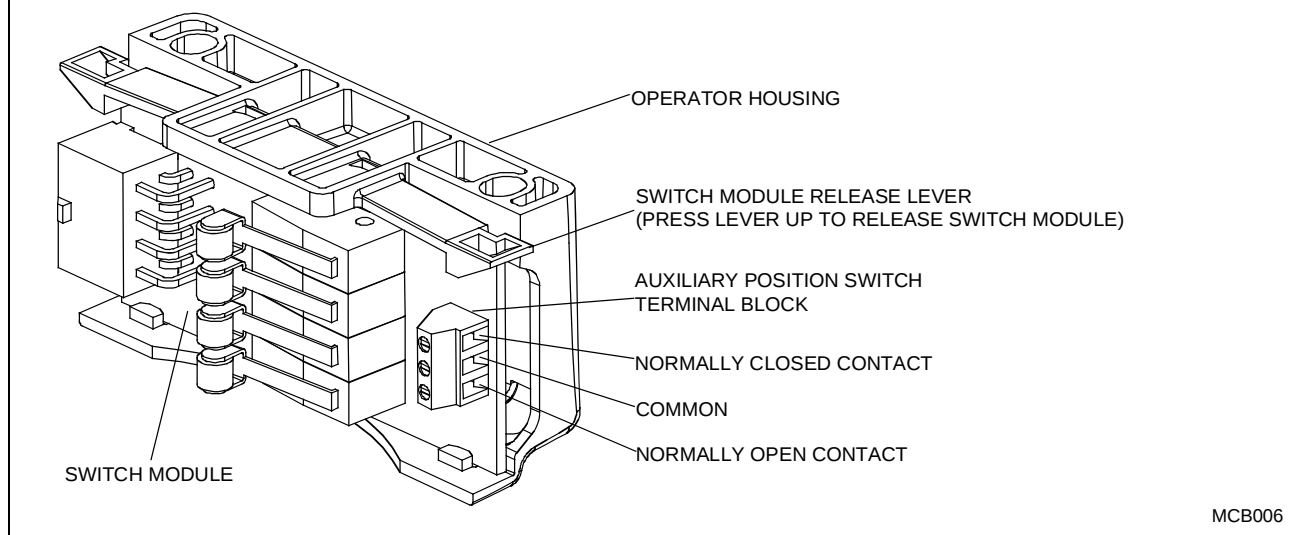
When checking breakout status switch continuity, the switch is checked twice; first with the door closed, then with the door in the breakout (negative 3°) position. In a dual-door application, both doors can be tested at the same time in the closed position. However, the doors must be tested *individually* when checking switch continuity with the doors in the breakout (negative 3°) position.

- c. ENSURE door is in the closed position.
- d. Using a multimeter, CHECK continuity between TB1 terminals 6 and 8, and ENSURE there is continuity.
- e. PUSH door in the breakout direction, and HOLD door at approximately the negative 3° position.
- f. Using a multimeter, CHECK continuity between TB1 terminals 6 and 8, and ENSURE there is an open circuit.
- g. RELEASE door.
- h. PLUG TB1 into control box circuit board.

3.5 Wiring the Operator Switch Module (Magic-Force Operators)

- 3.5.1 Refer to Attachment 2 or 3 as applicable, and CONNECT switch module harness 413791 to dual-adjustment closing speed control connector J4.
- 3.5.2 IF auxiliary position switch will be used, refer to Figure 3, and PERFORM the following:

Figure 3. Wiring the Auxiliary Position Switch (Magic-Force Operators)



- a. LIFT switch module release lever up, and SLIDE switch module out of operator housing.
- b. CONNECT wiring to auxiliary position switch terminal block as shown.

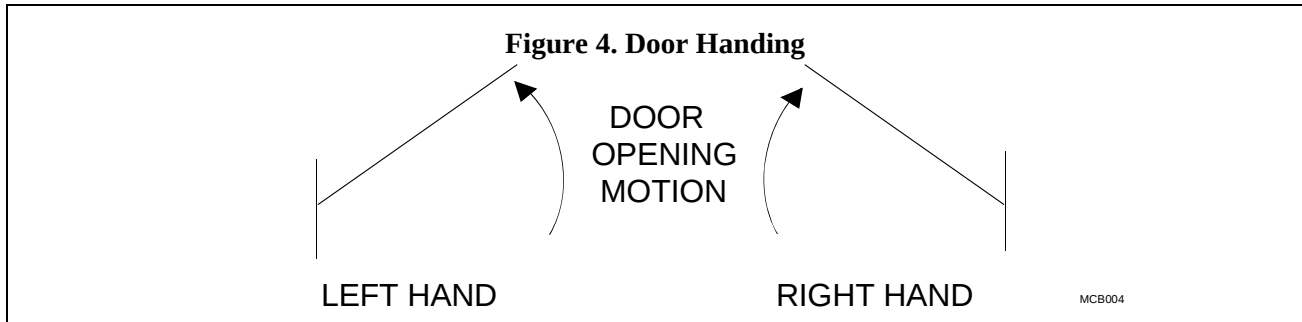
- c. SLIDE switch module into operator housing until switch module release lever snaps into place.

3.6 Wiring the Operator for Required Handing (Magic-Force Operators)

NOTE

Operator cams are factory-set for right hand operation.

- 3.6.1 Refer to Figure 4, and DETERMINE door handing.



- 3.6.2 CONFIGURE encoder for left or right hand operation as follows:

NOTE

There are two configurations of encoder wiring. Early model operators use a single encoder handing harness, P/N 413767. Later model operators use a single-circuit connector in line with green and white encoder wires.

- a. IF operator must be configured for *left hand* operation, refer to Attachment 2 or 3 as applicable, and PERFORM one of the following:
- IF operator is an early model configuration, INSTALL encoder handing harness (part No. 413767), and CONNECT motor harness to dual-adjustment closing speed control connector J1.
 - IF operator is a later model configuration, CONNECT the white encoder wire to the green encoder wire, the green encoder wire to the white encoder wire, and CONNECT the motor harness to dual-adjustment closing speed control connector J1.
- b. IF operator must be configured for *right hand* operation, refer to Attachment 2 or 3 as applicable, and CONNECT motor harness into dual-adjustment closing speed control connector J2.

3.7 Wiring the “ON/OFF/HOLD OPEN” Switch

- 3.7.1 Refer to Attachment 5, and CONNECT “ON/OFF/HOLD OPEN” switch wiring as follows:

TB1 Terminal	Connection	Switch Wire Color
1	Common	Yellow
2	Operate	Orange

3	Sensors	Violet
---	---------	--------

3.8 Wiring the Door Activation or Safety Device

NOTE

Attachments 5 and 6 illustrate typical wiring for various devices. Though the specific device may not be shown, this attachment can be used as a general guide. Specific wiring instructions from the manufacturer must also be consulted.

3.8.1 Refer to Attachments 5 and 6 and applicable manufacturer's instructions, and CONNECT door activation or safety device.

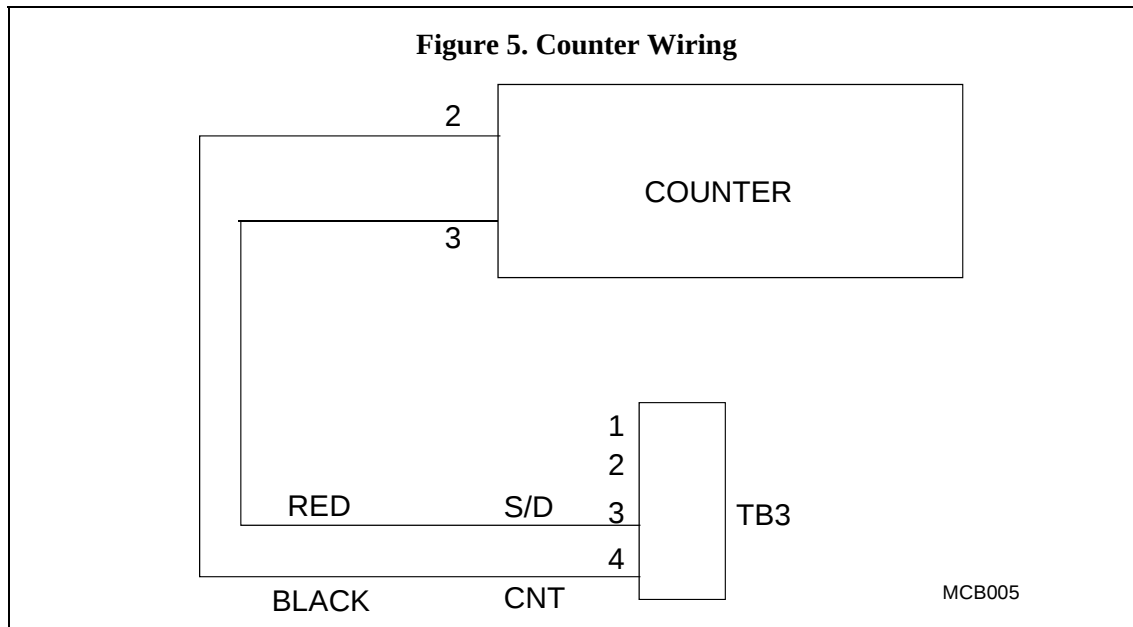
3.9 Wiring Sentrex³

3.9.1 Refer to Attachment 7, and CONNECT Sentrex³ as follows:

TB2 Terminal	Connection	Sentrex ³ Wire Color
1	VSX (+) Power for Sensor Head	Red
2	Serial Communication	Green
3	Serial Communication	White
4	GND (-) Ground for Sensor Head	Black

3.10 Wiring the Counter

3.10.1 Refer to Figure 5, and CONNECT wiring for counter.



4. TUNE-IN INSTRUCTIONS

4.1 **Initial Tune-In Settings**

4.1.1 DISCONNECT power pigtail assembly.

WARNING

To prevent injury to personnel and damage to equipment, the following settings must be made *before* applying power to control box.

4.1.2 SET potentiometers and switches to initial positions as follows:

- a. SET stall speed potentiometer to full clockwise (maximum) position.
- b. SET torque potentiometer to full clockwise (maximum) position.
- c. SET high/low range DIP switch S1 as applicable:

WARNING

When changing from low range to high range, the door will move faster.

CAUTION

To ensure proper operation of door, DIP switch S1 must be set to "H" (high range) on *all* full-energy, dual operator, Magic-Swing and bifold applications.

- IF single-operator full-energy application, dual-operator application, Magic-Swing application, or bifold application, SET to "H" (high range).
 - IF single-operator low-energy application, SET to "L" (low range).
- d. SET open speed potentiometer as applicable:
 - IF high/low range DIP switch S1 is set to ON (high-speed range), SET open speed potentiometer to midrange position.
 - IF high/low range DIP switch S1 is set to "OFF" (low-speed range), SET open speed potentiometer to maximum (full clockwise) position.
 - e. SET open check speed potentiometer to $\frac{3}{4}$ of full clockwise position.
 - f. SET time delay potentiometer to full counterclockwise (minimum) position.
 - g. SET Magic-Touch™ time delay rotary switch S4 to 0 (5 seconds).
 - h. SET "CLS" (close speed) rheostat to midrange position.
 - i. IF application is a Magic-Force installation, SET "CK" (close check speed) rheostat to full counterclockwise position.
- #### 4.1.3 Refer to Attachment 8, and PERFORM tune-in as applicable.

4.2 **Final Tune-In Adjustments**

- #### 4.2.1 ENSURE door-opening path is clear of all wires and obstructions.
- #### 4.2.2 SET "ON/OFF/HOLD OPEN" switch to "OFF."
- #### 4.2.3 CONNECT power pigtail assembly.

- 4.2.4 Refer to ANSI A156.10, "American National Standard for Power Operated Doors" or ANSI 156.19, "American National Standard for Power Assist and Low Energy Power Operated Doors," and DETERMINE ANSI door operating requirements.
- 4.2.5 CYCLE and RECYCLE door several times to verify proper speeds and forces, and PERFORM adjustments in the following order:
- a. ADJUST close check cam.
 - b. ADJUST open speed potentiometer.
 - c. ADJUST open check speed potentiometer.
 - d. ADJUST "CLS" (close speed) rheostat.
 - e. ADJUST "CK" (close check speed) rheostat.

NOTE

Adjustments to the "CK" (close check) rheostat also affect closing speed. Closing speed must always be checked after adjusting close check speed.

- f. ADJUST "CLS" (close speed) rheostat.

CAUTION

To prevent motor overheating and premature motor failure, stall speed potentiometer must *not* be set too high.

- g. ADJUST stall speed potentiometer.
- h. ADJUST torque potentiometer.
- i. ADJUST time delay potentiometer.

WARNING

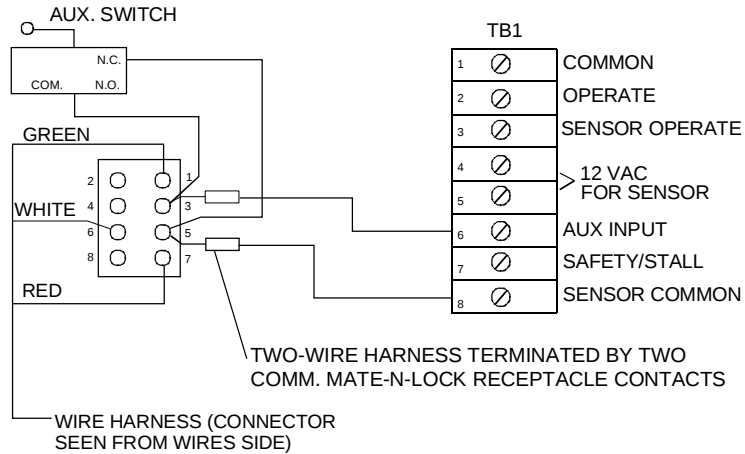
If the Magic-Touch time delay is set to 2 seconds, a safety sensor must be installed to ensure compliance with ANSI A156.19, "American National Standard for Power Assist and Low Energy Power Operated Doors," specifications.

- j. ADJUST Magic-Touch™ time delay rotary switch. IF the Magic-Touch time delay is set to 2 seconds, INSTALL and ADJUST safety sensor.
- k. ADJUST breakout and breakout status cams.

Attachment 1

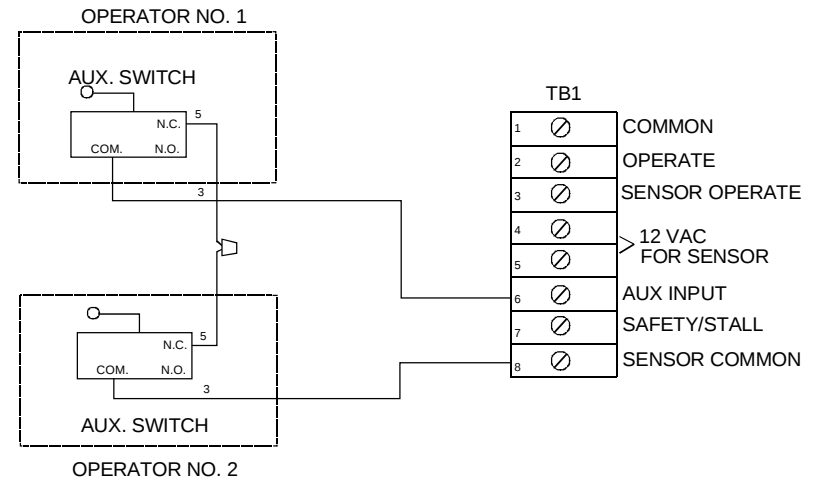
Breakout Status Wiring

(Sheet 1 of 1)



BREAKOUT STATUS WIRING--SINGLE DOOR

NOTE:
REMOVE CONTROL BOX JUMPER WIRE
FROM TERMINALS 6 AND 8.



BREAKOUT STATUS WIRING--DUAL DOOR

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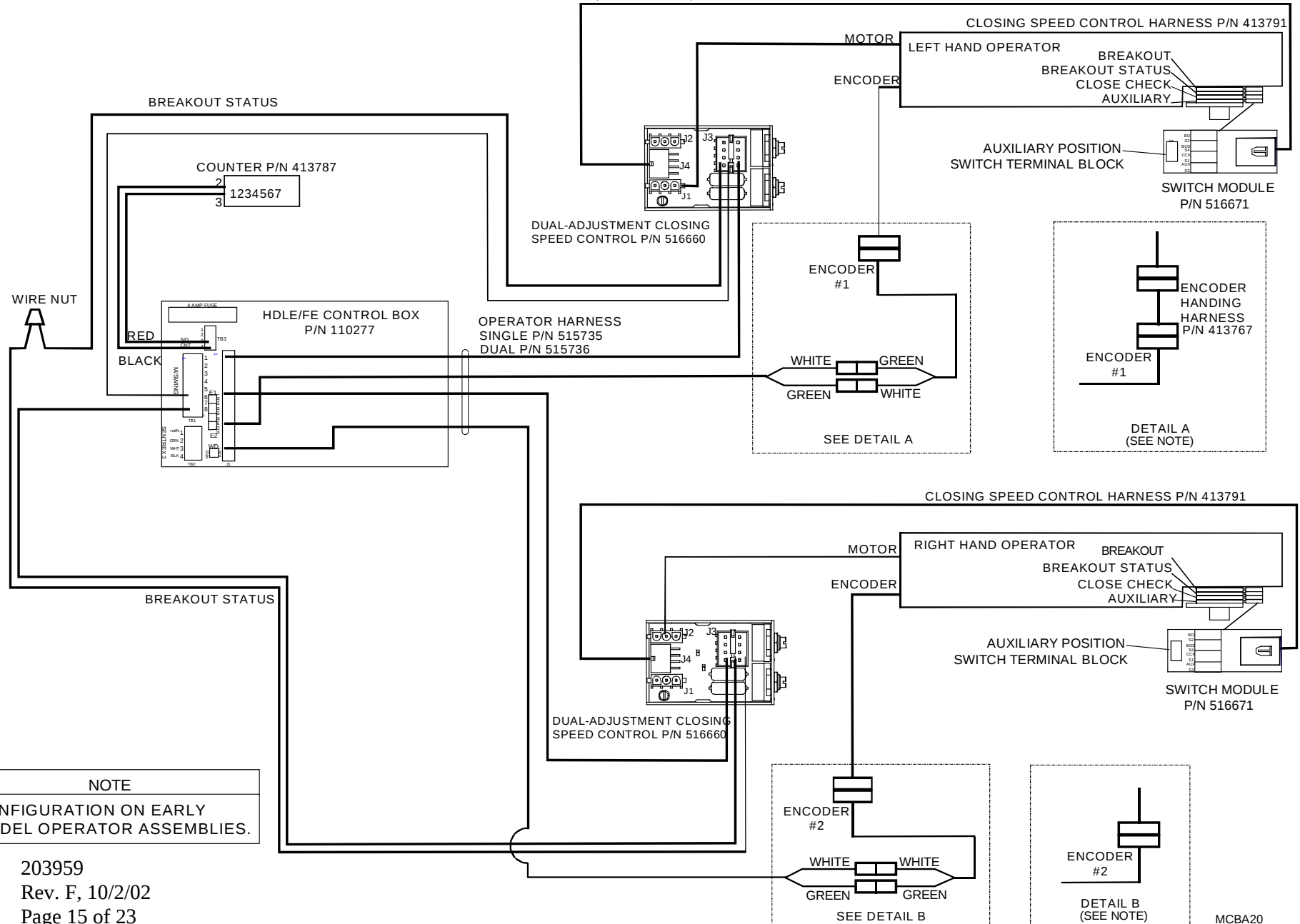
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Attachment 2

Magic-Force Operator Wiring—Dual Operators with Dual-Adjustment Closing Speed Controls and Switch Modules

(Sheet 1 of 1)



NOTE

CONFIGURATION ON EARLY
MODEL OPERATOR ASSEMBLIES.

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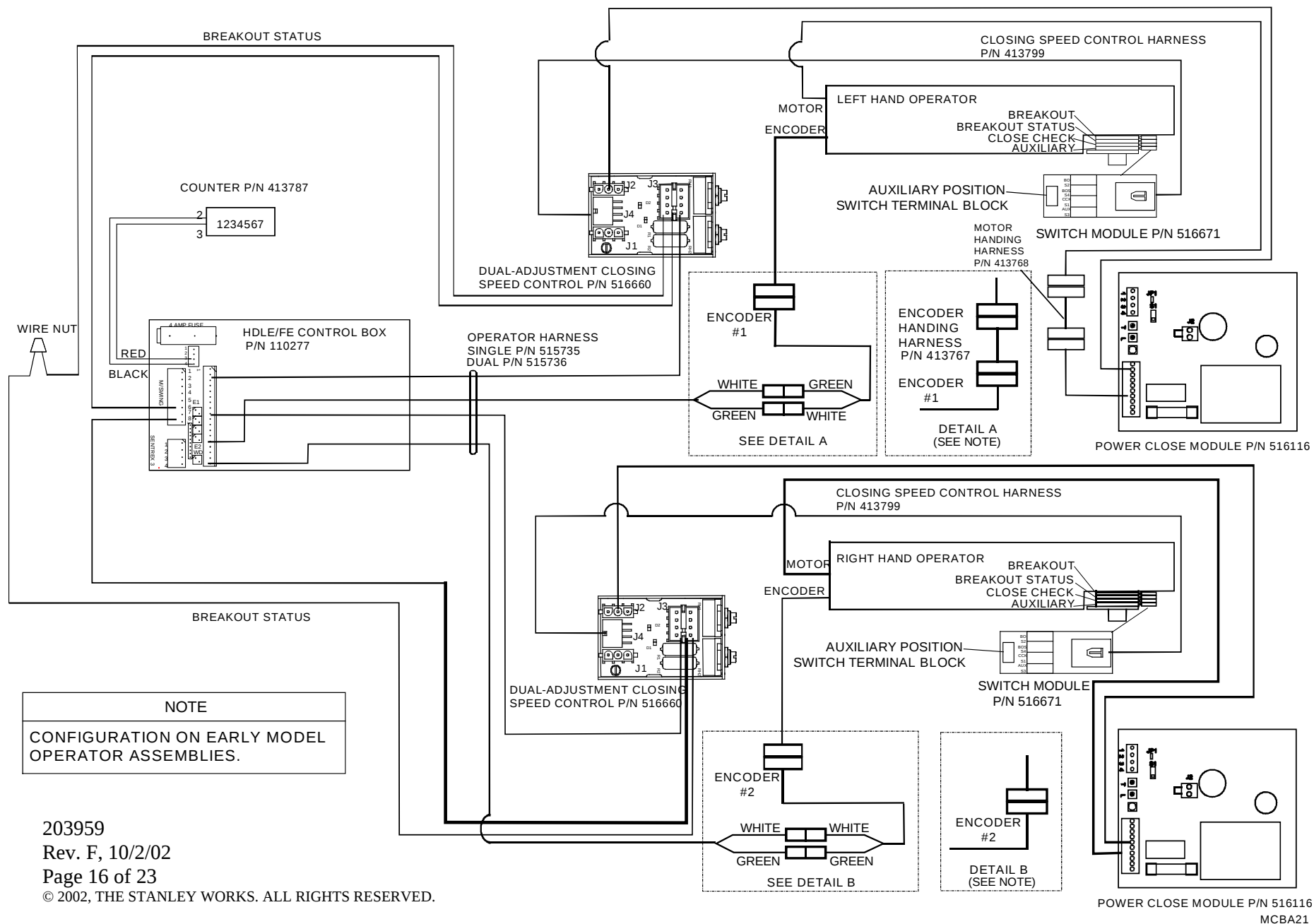
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Attachment 3

Magic-Force Operator Wiring—Dual Operators with Dual-Adjustment Closing Speed Controls, Power-Close Modules, and Switch Modules

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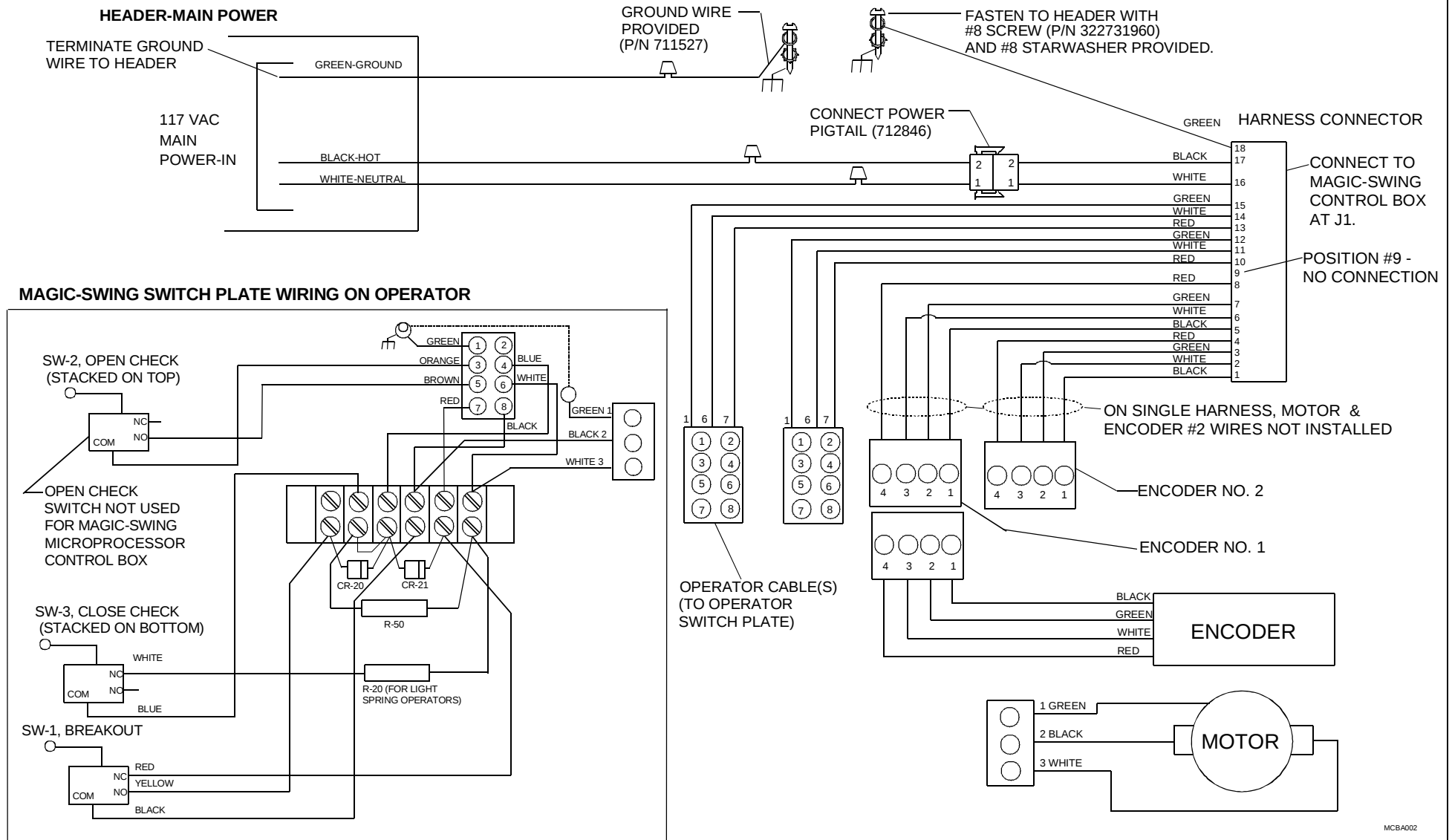
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POWER CLOSE MODULE P/N 516116
MCBA21

Attachment 4

Magic-Swing System Wiring—Main Power, Motor(s), and Encoder(s)

(Sheet 1 of 1)



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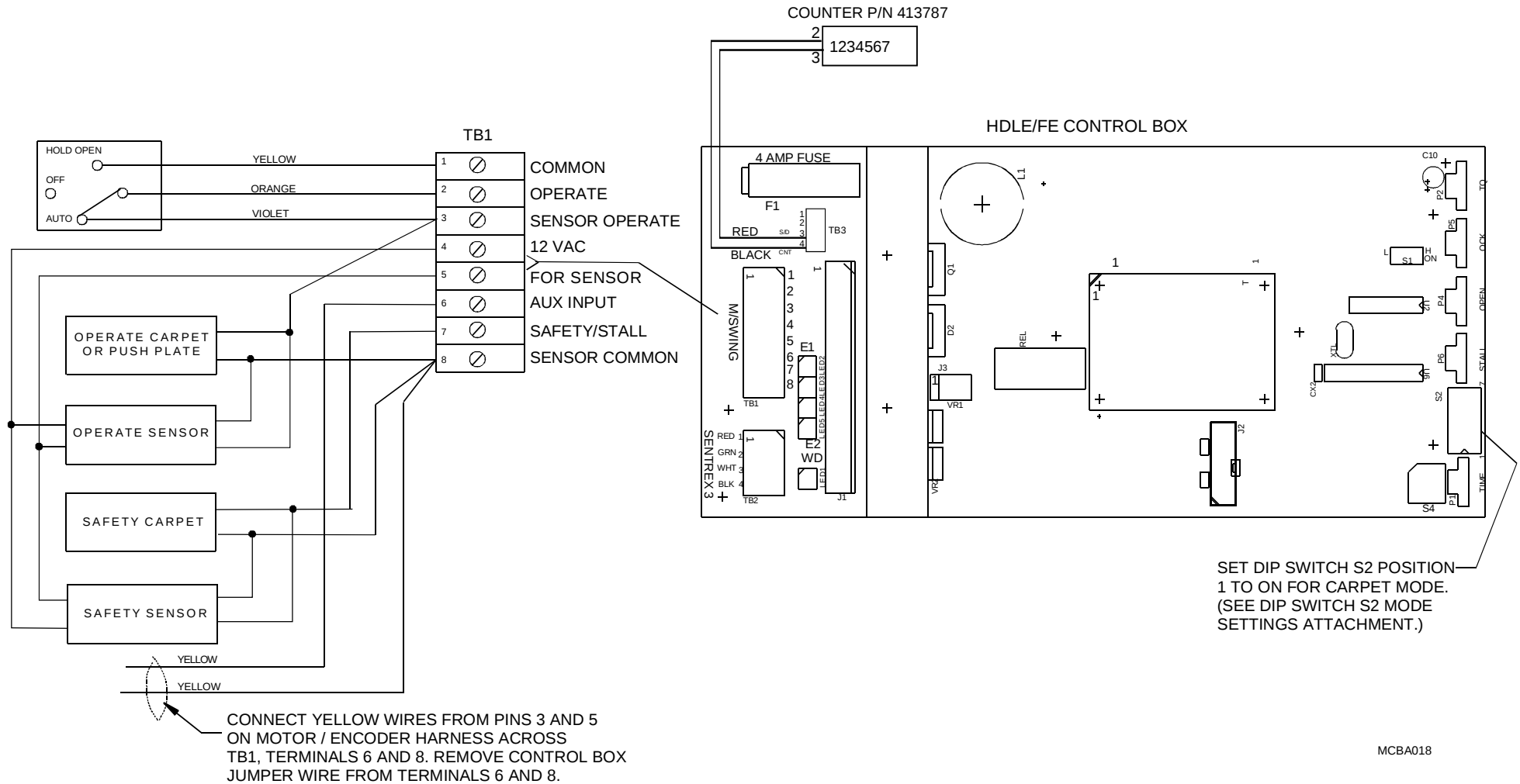
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MCBA002

Attachment 5

Signal Wiring—HDLE/FE Control Box With Carpets, Pushplate, Operate Sensor, or Safety Sensor (Sheet 1 of 1)



SET DIP SWITCH S2 POSITION 1 TO ON FOR CARPET MODE. (SEE DIP SWITCH S2 MODE SETTINGS ATTACHMENT.)

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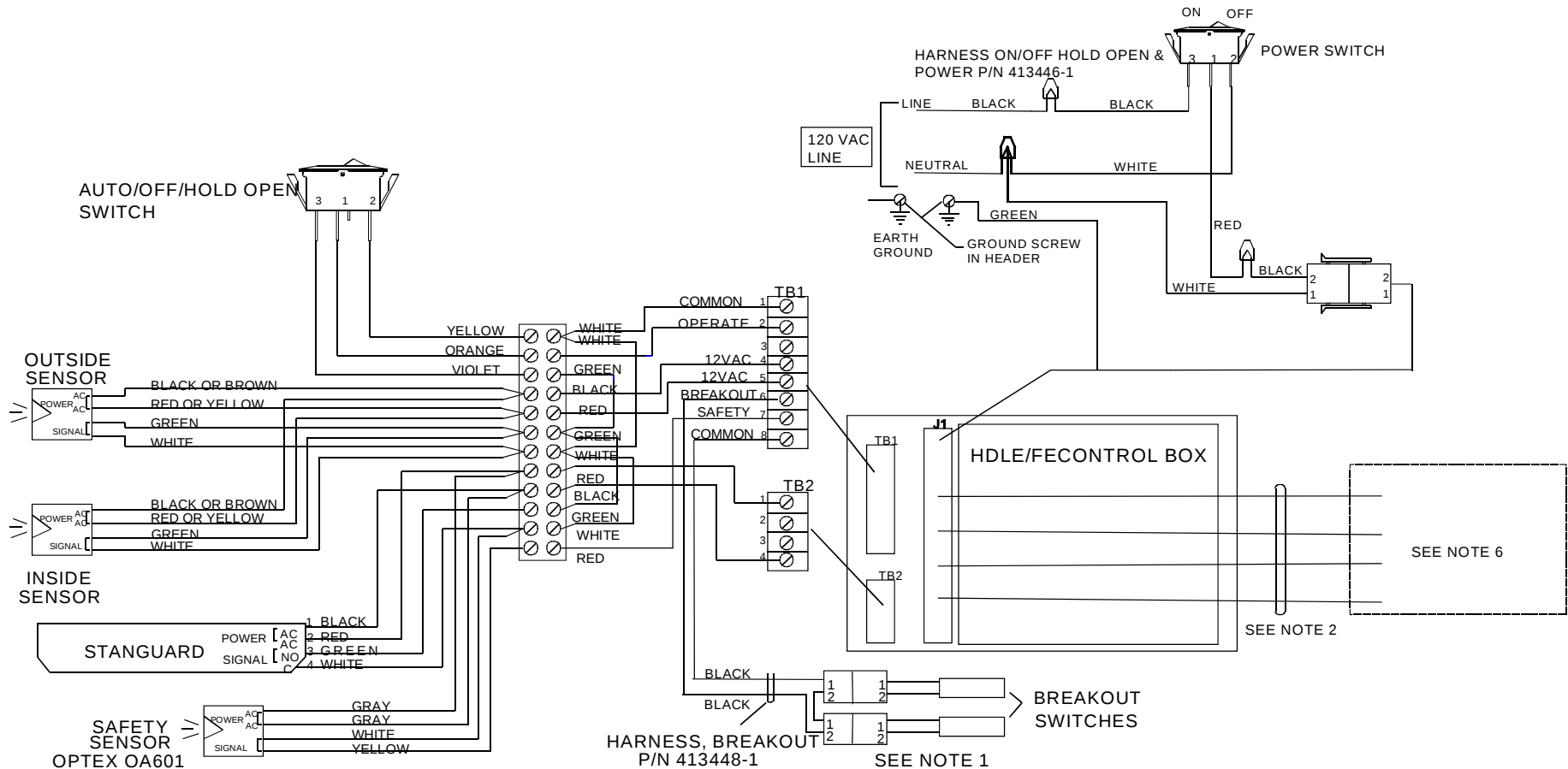
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Attachment 6

Wiring Diagram—HDLE/FE Control Box with Bifold Doors

(Sheet 1 of 1)



NOTES:

1. SCHEMATIC SHOWS BREAKOUT SWITCHES FOR A 4-PANEL BIFOLD. IF A TWO-PANEL BIFOLD IS USED, INSTALL TWO-POSITION JUMPER 713410 IN PLACE OF SECOND MAGNETIC SWITCH.
2. OPTIONAL CLOSING SPEED AND POWER CLOSE MODULES MAY BE ADDED BETWEEN THE MAGIC-SWING CONTROL BOX AND THE MAGIC-SWING OPERATOR.
3. OPTIONAL ENCODER EXTENSION HARNESS, P/N 412449-1.
4. OPTIONAL MOTOR EXTENSION HARNESS, P/N 413411-1.
5. ALL SENSOR SIGNAL OUTPUTS ARE DEFINED WITH THE POWER ON.
6. SEE ATTACHMENT 2 FOR STANDARD OPERATOR WIRING. SEE ATTACHMENT 3 FOR POWER CLOSE OPERATOR WIRING. WIRE BREAKOUT STATUS AS SHOWN.

MCBA011A

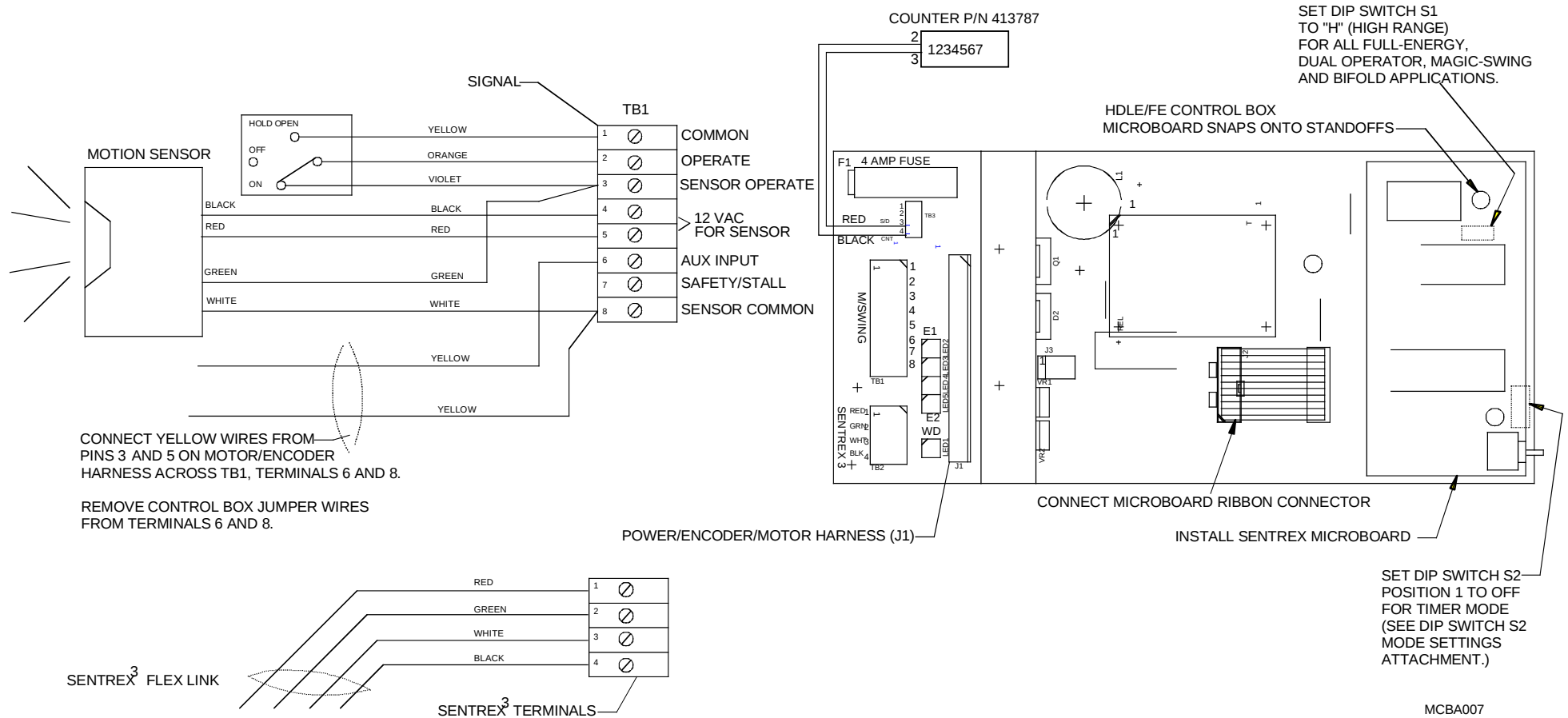
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Attachment 7 **Wiring Diagram—HDLE/FE Control Box with Sentrex³** (Sheet 1 of 1)



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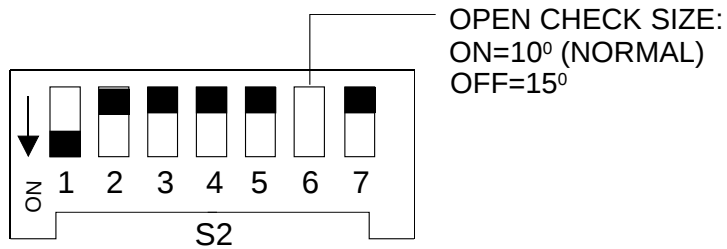
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Attachment 8

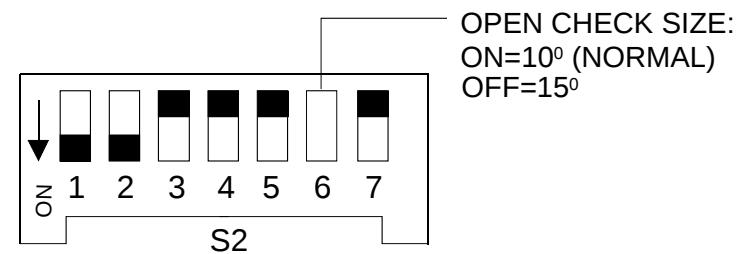
DIP Switch S2 Mode Settings

(Sheet 1 of 2)

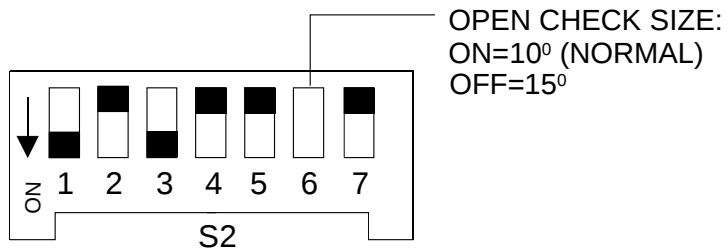
CARPET MODE, SINGLE DOOR, ONE-WAY TRAFFIC



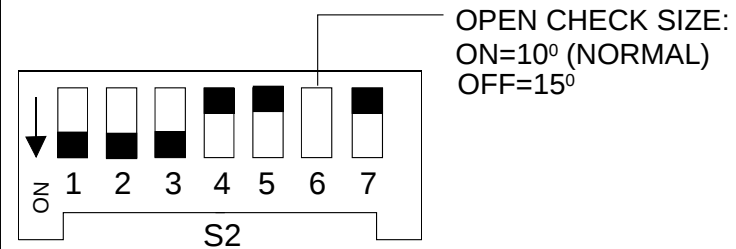
CARPET MODE, DUAL DOOR, ONE-WAY TRAFFIC



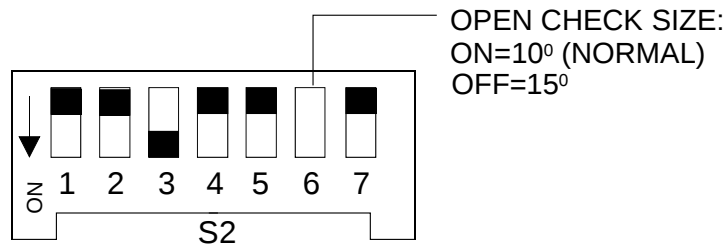
CARPET MODE, SINGLE DOOR, TWO-WAY TRAFFIC OR ONE-WAY CROSS TRAFFIC



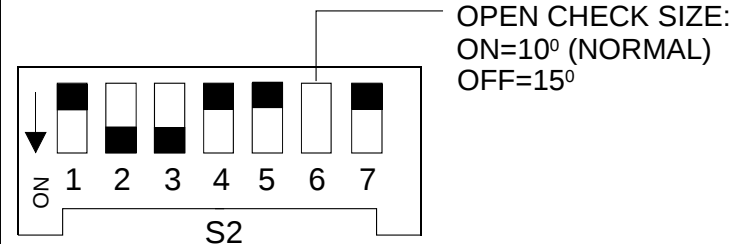
CARPET MODE, DUAL DOOR, TWO-WAY TRAFFIC OR ONE-WAY CROSS TRAFFIC



TIMER MODE, SINGLE DOOR, PUSH PLATE TO OPEN/CLOSE (2S LOGIC)



TIMER MODE, DUAL DOOR, PUSH PLATE TO OPEN/CLOSE (2S LOGIC)



NOTE: BLACK INDICATES SWITCH POSITION.

EXAMPLE:  INDICATES SWITCH POSITION 1 IS SET TO ON.

 1

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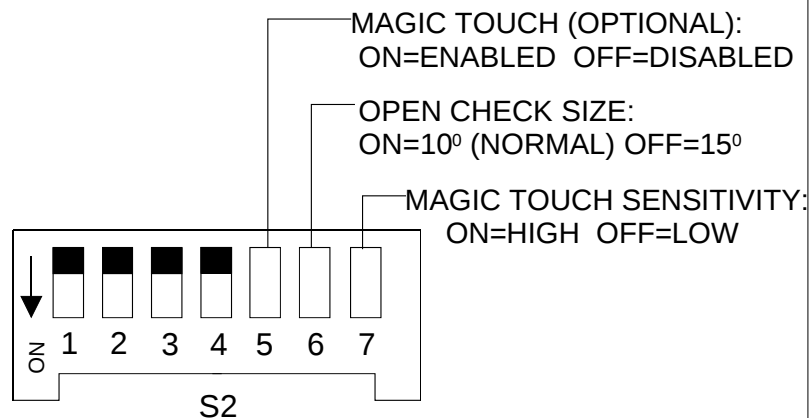
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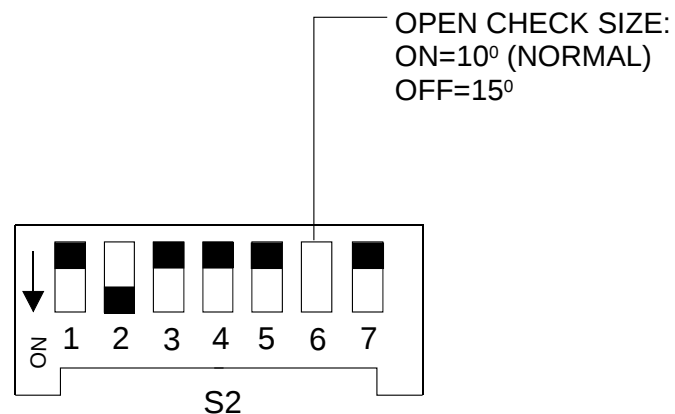
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Attachment 8
DIP Switch S2 Mode Settings
(Sheet 2 of 2)

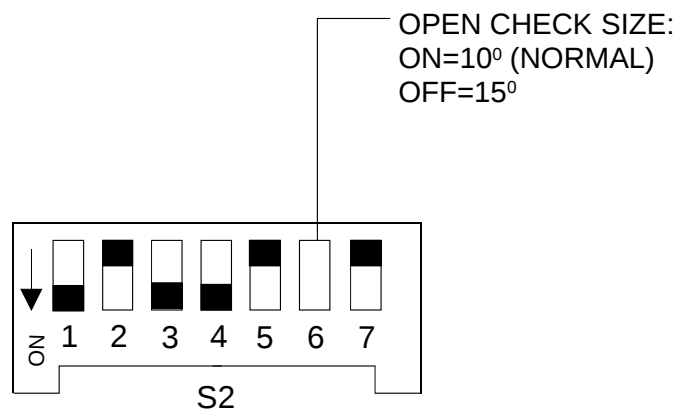
**TIMER MODE, SINGLE DOOR WITH SENTREX³
OR PUSH PLATES**



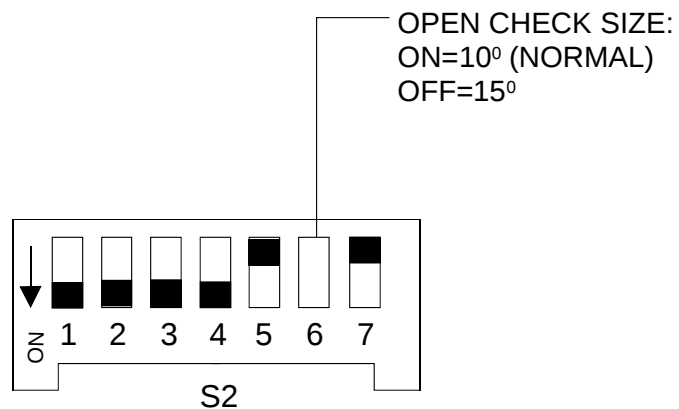
**TIMER MODE, DUAL DOOR WITH SENTREX³
OR PUSH PLATES**



BIFOLD APPLICATION, SINGLE DOOR, TWO-PANEL



BIFOLD APPLICATION, DUAL DOOR, FOUR-PANEL



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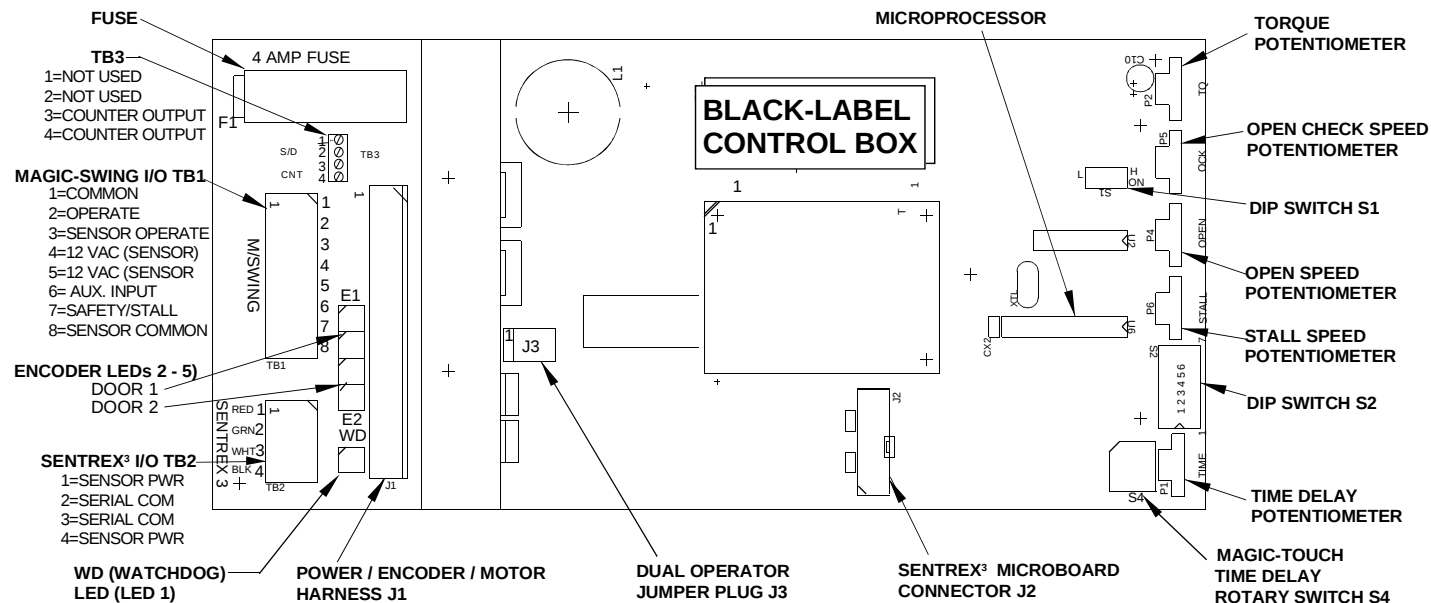
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Attachment 9

HDLE/FE Control Box

(Sheet 1 of 1)



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